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## School Audits and School Improvement: Exploring the Variance Point Concept in Kentucky's Elementary, Middle, and High Schools

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As a diagnostic intervention (Bowles, Churchill, Effrat, & McDermott, 2002) for schools failing to meet school improvement goals, Kentucky used a scholastic audit process based on nine standards and 88 associated indicators called the Standards and Indicators for School Improvement (SISI). Schools are rated on a scale of 1–4 on each indicator, with a score of 3 considered as fully functional (Kentucky Department of Education [KDE], 2002). As part of enacting the legislation, KDE was required to also audit a random sample of schools that did meet school improvement goals; thereby identifying practices present in improving schools that are not present in those failing to improve. These practices were referred to as variance points, and were reported to school leaders annually. Variance points have differed from year to year, and the methodology used by KDE was unclear. Moreover, variance points were reported for all schools without differentiating based upon the level of school (elementary, middle, or high). In this study, we established a transparent methodology for variance point determination that differentiates between elementary, middle, and high schools.

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### Introduction

The Standards and Indicators for School Improvement (SISI) were put in place in Kentucky's public schools in 2000 to support the Scholastic Audit process, which was enacted in 1998 as part of the school accountability legislation (703 Kentucky Administrative Regulation 5:120). These nine standards and 88 indicators were the basis for scholastic audits of schools failing to meet school improvement goals, as well as a sample of how schools were meeting goals. Audits of these two groups of schools with the SISI revealed factors that distinguished the groups, and that was viewed as valuable in focusing the improvement efforts of schools and school districts across Kentucky. KDE initially referred to these indicators as *leverage points*, but

changed the reference to *variance points* because these indicators represented variance in audit results between the two groups of schools. KDE communicated these variance points to school leaders as information to assist in prioritizing school improvement practices (Kentucky Department of Education [KDE], 2003). It is the identification and subsequent use of identified indicators that form the foundation for the variance point concept and provide the basis for this research.

The variance point concept presented great intuitive appeal and practical application for school leaders in Kentucky. It stood to reason that if a discrete set of best practices were demonstrated empirically as true variance points, the prioritization of school improvement efforts would become clearer. New variance point reports were issued after each cycle of audits, with results ranging widely in terms of the number

and emphasis of the indicators that were identified as variance points. For example, there were 11 variance points reported for the 2004 scholastic audit cycle (Common Variance Points 2004, n.d.), yet the 2004–2005 report identified 51 variance points (Variance Points 2004–2005, n.d.). Moreover, an investigation of perceptions of the impact of the SISI on school improvement revealed that elementary school personnel had greater confidence in, and agreement with, SISI recommendations than middle or high school personnel (Appalachian Educational Laboratory [AEL], 2002).

## Statement of the Problem

The SISI and related variance points were a valuable tool for school leaders involved in school improvement, yet inconsistencies in variance point results and differences in perceptions between elementary and middle/high school personnel as to the efficacy of the process suggested a need to report the variance points by school level. The purpose of this study was to apply appropriate measures of association to scholastic audit results for schools classified as Assistance Level 3 and Meeting Goals for the period from 2004–2008 to identify significant school improvement indicators for elementary, middle, and high schools.

## Background

An understanding of variance points was predicated upon an understanding of the SISI and Kentucky's accountability system. The SISI were only a part of a large, complex system of assessments, criteria, sanctions, and supports stipulated by the Kentucky General Assembly for schools failing to meet improvement goals (Kentucky Revised Statutes 158.6455(5)). Bowles, Churchill, Effrat, and McDermott (2002) developed the Intervention Decision-Making Framework for use by policymakers to provide clarity as to how the elements of education accountability systems interrelated. This framework was composed of: Performance Criteria, Strategic Criteria, Diagnostic Intervention, Corrective Intervention, Targets, Tactics, and Exit Criteria.

## Kentucky's Educational Accountability Model

The Commonwealth Accountability and Testing System (CATS) classified schools as Assistance Level, Progressing, or Meeting Goals based upon school performance relative to improvement goals. KDE was the agency responsible for the administration of CATS and related interventions.

*Performance criteria.* Criteria for each classification related to the *accountability index* for each school, a score from 0 to 140, based upon student performance on a combination of academic and nonacademic indicators. The statewide goal for schools in 2014 was an accountability index of 100. The *baseline* accountability index for each school was determined based upon 2000 CATS results and was used to determine the *goal line* leading from the baseline to the goal of 100 in 2014 (Bowles et al., 2002; 703 KAR 5:020; KDE, 2003).

By regulation (703 Kentucky Administrative Regulation 5:020), schools were classified each biennium as Meeting Goals, Progressing, or Assistance based upon whether the average accountability index for that biennium exceeded the goal line (Meeting Goals), fell below the *assistance line* (Assistance) or fell between the goal line and assistance line (Progressing). Figure 1 (page 3) illustrates the interaction between the accountability index and the goal line, thereby determining the level for each school.

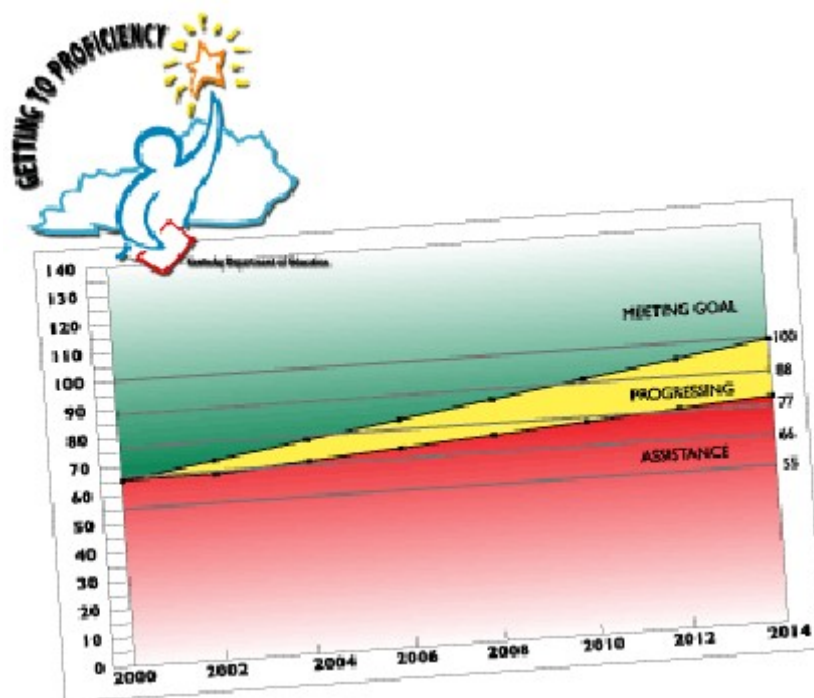
*Strategic criteria.* To facilitate the allocation of the most intensive interventions to the schools in the most need, schools classified as Assistance were further divided into three equal groups or assistance levels (Level 1, Level 2, and Level 3) based upon accountability indices. Level 3 Assistance schools made up the lowest-performing third of the assistance schools (Bowles et al., 2002; KDE, 2003).

*Diagnostic Criteria.* Scholastic audits were required of both Assistance Level 2 and Assistance Level 3 schools (Bowles et al., 2002). Scholastic audits used the SISI as the basis for the evaluation of three areas of school functioning: academic performance, learning environment, and efficiency. As described in Appendix A, these three areas encompassed nine standards, composed of 88 indicators (KDE, 2002).

Each of the 88 indicators was supported by a scoring rubric that specified the types of evidence to be examined, as well as descriptors of the evidence required for each of four categories of classification: (a) Rating of 1—little or no development or implementation; (b) Rating of 2—limited development or

partial implementation; (c) Rating of 3—fully functioning and operational level of development and implementation; and (d) Rating of 4—exemplary level of development and implementation. A rating of 3 was viewed as on-target, and a score of 4 as ideal (KDE, 2002).

Figure 1. Key Components of Kentucky's Long-Term Education Accountability Model



*Corrective intervention.* The results of the scholastic audit guided the nature of school improvement activities, which were led in part by a Highly Skilled Educator (HSE) who was assigned to the school by KDE (703 KAR 5:120; Bowles et al., 2002).

*Target and tactic.* School improvement interventions included professional development for teachers and school administrators as appropriate and as informed by the Scholastic Audit. These interventions were monitored by the HSE, whose primary goal was to facilitate change (Bowles et al., 2002).

*Exit criteria.* Scholastic audit recommendations guided school improvement efforts and served as criteria for schools to exit assistance (Bowles et al., 2002).

### ***The Scholastic Audit Process***

In 1998, the Kentucky General Assembly enacted legislation requiring an audit of all the schools failing to meet state improvement goals, and of a sample of

schools successful in meeting state improvement goals. A team composed of at least one HSE, one parent, one teacher, one administrator and one university faculty member conducted the audits. The audit team addressed the learning environment and efficiency of the school, the academic performance of the students, and the school council's data analysis and planning practices. Recommendations were to be made by the team to the Kentucky Board of Education (KBE) regarding the school's performance classification and the assistance required to address deficiencies at each school (KRS 158.6455[5]).

### ***The SISI***

In 2000, KBE adopted administrative regulations that identified guidelines for these scholastic audits, and specified the SISI as the basis of the audits (703 KAR 5:120). Best practices were divided into three domains: (a) Academic Performance, (b) Learning Envi-

ronment, and (c) Efficiency. There were three standards associated with each of these areas: (a) Academic Performance was composed of Curriculum (Standard 1), Classroom Evaluation/Assessment (Standard 2), and Instruction (Standard 3); (b) Learning Environment was composed of School Culture (Standard 4), Student, Family, and Community Support (Standard 5), and Professional Growth, Development, and Evaluation (Standard 6); and (c) Efficiency was composed of Leadership (Standard 7), Organizational Structure and Resources (Standard 8) and Comprehensive and Effective Planning (Standard 9) (KDE, 2002).

The purpose behind the SISI is not unlike the efforts behind the work of others who have sought to identify practices that are common in schools that show a high level of student learning. In response to the Equality of Educational Opportunity Study (Coleman et. al, 1966) researchers such as Brookover and Lezotte (1979) and Edmonds (1981) identified practices prevalent in high-poverty, high-achieving schools. Their work, along with the work of other effective school researchers, became the foundation for the Effective Schools Correlates. More recently, researchers such as Marzano (2003), Reeves (2003), and McEwan (2008) have identified practices in schools that reflect a high level of student learning. A number of practices, correlates, or scholastic indicators emerge that, when applied, have been shown to improve student learning.

### ***Variance Points***

The initial legislation stated that, for "informational purposes," schools meeting state goals were to be audited and the results of these audits reported (KRS 158.6455[5]). Regulations specified that a randomly selected sample of schools meeting goals were to be audited, but did not specify the parameters of the audit (703 KAR 5:120). As KDE completed full audits of Level 3 Assistance schools and a sample of Meeting Goals schools, comparisons were made between the audit results of these two groups of schools. In 2003, KDE published an analysis of these comparisons that identified a subset of the 88 indicators as related to school improvement and referred to these as *variance points*. Based upon the 2002–2003 audit data, 27 of the 88 indicators were identified as variance points and used as a basis for best practice recommendations

for Kentucky's schools. It was unclear what method was used to determine these original variance points (KDE, 2003).

Since the publication of the 2002–2003 variance points document, additional reports were created based upon scholastic audits for 2004, 2004–2005, and 2004–2006 (Common Variance Points 2004, n.d.; Variance Points 2004–2005, n.d.; Variance Points 2004–2006, n.d.). The number of variance points reported ranged from 11 to 51.

### ***Diagnostic Nature of the SISI and Variance Points***

The conceptual framework established by Bowles et al. (2002) identified the role of the SISI as that of a diagnostic intervention. Information based on the SISI directly influenced the corrective interventions and exit criteria for schools in Assistance Level 2 and Assistance Level 3 (Bowles, et al., 2002). Variance points served the purpose of highlighting promising practices for all schools in Kentucky (KDE, 2003). If the SISI effectively diagnosed problems within struggling schools, then by definition, variance points communicated to school leaders specific policies, practices, and characteristics that led to school improvement in Kentucky. It was critical that variance point information be correct and appropriate for all schools, regardless of school level. Confidence in the scholastic audit process and the SISI was lower for secondary personnel than elementary personnel (AEL, 2002), pointing to either a lack of understanding of the SISI or recommendations that were not reflective of the school environment in question.

It is important to note that much of the research examining effective school practices has looked more at the schooling process across P–12 than at effective practices found within elementary, middle, or high schools. Certainly child development is different at each level. High schools tend to be larger and more departmentalized by content area than do elementary schools. The needs of middle school students differ from that of their younger and older counterparts. Therefore, it seems likely that not all educational strategies and instructional practices would be equally effective at each level. Heretofore, the research comparing the effectiveness of identified practices when implemented at each school level has been limited.

## Statement of Purpose

The purpose of this study was to provide school leaders serving at each level—elementary, middle, and high school—with an empirically based listing of indicators from the SISI that were statistically significantly related to schools meeting goals, as compared to those in Assistance Level 3. Significant indicators were determined using scholastic audit results from 2004 to 2008, calculating elementary, middle, and high school data separately. Results of these school-level calculations were compared to each other and to current variance points from KDE to answer the following questions:

1. In what standards did significant indicators occur for elementary, middle, and high schools? How did these compare to the extant KDE variance points?
2. What types of significant indicators were common across all three levels of schools? What types of indicators were significant for specific school levels only?
3. Which indicators were the most related to school improvement for each school level?
4. Were there indicators that were not demonstrated to be significant for any level of school? What is the implication for these indicators?
5. Based upon most related indicators, what associated best practice was suggested?

## Variables

Since the sample was a purposive, convenience sample, demographic and accountability measures were used to compare the nature of the Level 3 Assistance and Meeting Goals schools.

*Poverty level of school.* School poverty levels were estimated using the 2005–2006 free and reduced lunch participation rates for each school (Nutrition and Health Services, 2005).

*Community type.* The nature of each community in terms of urban-rural character was estimated using the Urban-Rural Continuum from the United States Department of Agriculture (USDA) for 2003 for the county in which the school resided. The Urban-Rural Continuum Codes ranged on a scale from 1–9, based on total population, and population density. For this study, ratings were grouped as (a) *Metro*, ratings 1, 2,

or 3; (b) *Urban-metro adjacent*, ratings of 4 or 6; (c) *Urban*, ratings of 5 or 7; (d) *Rural-metro adjacent*, a rating of 8; and (e) *Rural*, a rating of 9.

*Academic index.* The Academic Index for each school was used to describe student achievement at the time of the audit. This information was included with the data set provided to researchers from KDE.

## Method

### Participants

A purposive, convenience sample of 60 Kentucky elementary, middle, and high schools was used. During the period from 2004 to 2008, scholastic audits were performed with these schools either because they were classified as Level 3 Assistance or chosen from schools Meeting Goals. Of these schools, 24 were classified as Level 3 Assistance and 36 as Meeting Goals. Of the Level 3 Assistance schools, there were seven elementary, 10 middle, and seven high schools. Meeting Goals schools were composed of 19 elementary, eight middle, and nine high schools.

*Sample description.* Academic and socioeconomic indicators for the period from 2004 to 2008 were summarized for the sample in Table 1 (page 4). Level 3 Assistance schools achieved at a lower level than did schools classified as Meeting Goals that were audited, which would be expected given the criteria for group membership. Socioeconomic measures indicated that Level 3 Assistance schools were poorer and less rural than schools classified as Meeting Goals that were audited.

### Instrumentation

The Kentucky Department of Education developed the SISI for the purpose of conducting audits required for Assistance Level and other selected schools. The indicators and related criteria were reportedly derived from a published research base. Criteria for each of the 88 indicators was articulated through rubrics (KDE, 2006), which were applied by the scholastic audit team (KDE, 2002). These teams were trained on the use of the rubrics by the KDE (2002) to establish consistency between audits. There were no published reports of the construct validity or reliability for the indicators, the rubric criteria, or the audit process.

Table 1. Sample Characteristics by School Level and Accountability Classification

	Elementary		Middle		High	
Academic and demographic descriptors	AL3	MG	AL3	MG	AL3	MG
Academic Index (Mean)	57.2	86.1	53	82.4	57.8	82.3
Free & Reduced Lunch (Mean)	89.3%	60.5%	79.8%	37.8%	64.6%	30.2%
Community Type						
Metro	4	4	9	3	4	3
Urban-Metro Adjacent	1	4	0	3	0	2
Urban	2	6	0	2	1	4
Rural-Metro Adjacent	0	2	1	0	1	0
Rural	0	3	0	0	1	0

### Analysis

The Kendal-Stuart Tau-c was the measure of association used with ranked, ordinal data (Mehta & Patel, 1996). Scholastic Audit data for each indicator was represented by a number from 1–4, with 1 representing little or no implementation, and 4 representing exemplary implementation. The Kendal-Stuart Tau-c represented as a number between -1 and 1 the strength of relationship between these indicator ratings and the school classification (Level 3 Assistance, Meeting Goals). A Tau-c was calculated using SPSS v13.0 for each of the 88 indicators, for each of the three school levels resulting in 264 calculations. Multiple comparisons increased Type-I error and required the use of a  $p = 0.000$  for statistical significance.

### Procedure

Ratings for all scholastic audits (N=296) conducted from 2002 through the spring of 2008 were provided to researchers by the KDE in an electronic format. This file contained the ratings (1 to 4) for each audited school on each of the 88 indicators, the performance level for each school at the time of the audit (Assistance Level 3, Assistance Level 2, Meeting Goals, etc.), the year of the audit, and the academic index for the school at the time of the audit. A purposive, convenience sample was selected for the study that met the following conditions: (a) the audit was conducted since January 2004; (b) the audit was for a school classified as either Level 3 Assistance school or

Meeting Goals; (c) the school was not a P–12 school; and (d) if schools were audited more than once since 2004, only the oldest audit was included in the study. Sixty schools met the stated criteria for use in the study.

Schools in the sample were coded in terms of classification (Assistance Level 3, Meeting Goals) and level (elementary, middle, or high). SPSS v13.0 was used to determine the Kendall-Stuart Tau-c for each indicator at each level. Once all analyses were complete, significant indicators were identified for each level of school.

### Results

This study sought to refine the variance point concept by disaggregating audit data based upon school level (elementary, middle, and high), thereby providing school leaders with more precise guidance for school improvement in Kentucky. An analysis of the results does provide some guidance for leadership decisions, based on the level of the school.

#### *In what standards did the variance points occur? How did these compare to KDE variance points?*

Analysis of audit data revealed 21 significant indicators for elementary schools, 14 significant indicators for middle schools, and 33 significant indicators for high schools. Significant indicators were examined relative to the standards they were contained within, and also to the 43 variance points reported by KDE for the

same period. Variance points from KDE and significant indicators for elementary, middle, and high schools were distributed across the standards, as indicated in Tables 2, 3, and 4 (page 6). Differences existed between the standards of emphasis between all three lev-

els of school and also with KDE variance points. Eight of the 43 variance points reported by KDE were not significant for any of the three school levels: 2.1e, 2.1f, 4.1d, 4.1k, 6.1a, 6.1b, 7.1c, and 8.1c. (See appendix for a description of each indicator.)

Table 2. Significant Indicators from the Academic Performance Standards Compared by School Level and with KDE Variance Points from 2004–2007

Academic Performance Standards and Indicators														
Curriculum					Classroom Evaluation and Assessment					Instruction				
SISI	KDE	E	M	H	SISI	KDE	E	M	H	SISI	KDE	E	M	H
1.1a	x	x			2.1a			n/a		3.1a	x		x	x
1.1b					2.1b	x		n/a	x	3.1b				
1.1c					2.1c	x	x	n/a		3.1c				x
1.1d					2.1d	x			x	3.1d	x		x	x
1.1e		x			2.1e	x				3.1e			na	
1.1f					2.1f	x				3.1f	x			x
1.1g	x	x			2.1g					3.1g				
					2.1h		x			3.1h	x		x	

All indicators significant at the  $p=.000$  level. n/a denotes no rating of 3 or 4 reported in the sample.

*Elementary schools.* The 21 significant indicators for elementary school were distributed across eight of the nine standard areas; only Standard 3 did not have a significant elementary indicator. Compared to the extant KDE variance points, the elementary indicators

were common to 16 indicators, with five new indicators emerging from the disaggregated analysis. These emerging indicators included: 1.1e, 2.1h, 5.1b, 9.3b, and 9.4b.

Table 3. Significant Indicators from the Learning Environment Standards Compared by School Level and with KDE Variance Points from 2004–2007

Learning Environment Standards and Indicators														
School Culture					Student, Family and Community Support					Professional Growth, Development and Evaluation				
SISI	KDE	E	M	H	SISI	KDE	E	M	H	SISI	KDE	E	M	H
4.1a	x		x	x	5.1a	x	x		x	6.1a	x			
4.1b	x			x	5.1b		x		n/a	6.1b	x			
4.1c	x	x	x	x	5.1c	x			x	6.1c			x	x
4.1d	x				5.1d	x	x	x	x	6.1d				
4.1e	x		x		5.1e			x		6.1e	x			x
4.1f				n/a						6.1f				x
4.1g	x		x	x						6.2a				
4.1h	x	x	x	x						6.2b	x			x
4.1i	x		x	x						6.2c	x	x	x	
4.1j	x	x		x						6.2d	x	x		
4.1k	x									6.2e				
										6.2f	x	x		x

All indicators significant at the  $p=.000$  level. n/a denotes no rating of 3 or 4 reported in the sample

*Middle schools.* There were only 14 indicators that were significant for middle schools, the least amongst the school levels. These were divided across only five of the nine standards, with Standards 1, 2, 7, and 9 absent significant indicators. Compared to the extant

KDE variance points, the middle school indicators were common to 12 indicators, with two indicators emerging from the disaggregated analysis. These emerging indicators included: 5.1e and 6.1c.

Table 4. Significant Indicators from the Efficiency Standards Compared by School Level and with KDE Variance Points from 2004–2007

Efficiency Standards and Indicators														
Leadership					Organizational Structure and Comprehensive Planning					Effective				
SISI	KDE	E	M	H	SISI	KDE	E	M	H	SISI	KDE	E	M	H
7.1a				x	8.1a					9.1a			na	
7.1b	x	x		x	8.1b	x	x			9.2a				
7.1c	x				8.1c	x				9.2b				
7.1d					8.1d	x	x			9.3a				
7.1e	x			x	8.1e				x	9.3b		x		
7.1f	x	x		x	8.1f	x				9.3c				x
7.1g	x			x	8.2a				x	9.4a				
7.1h	x	x		x	8.2b					9.4b		x		
7.1i			na		8.2c					9.5a				x
7.1j				x	8.2d	x		x		9.5b				
7.1k	x			x						9.5c			na	
										9.5d				
										9.6a			na	
										9.6b				
										9.6c				
										9.6d			na	

All indicators significant at the  $p=0.000$  level. n/a denotes no rating of 3 or 4 reported in the sample.

*High schools.* There were 33 significant indicators for high schools, the most of the three school levels. Standard 1 did not contain any significant indicators with the other indicators shared by the other eight standards. Compared to the extant KDE variance points, the high school indicators were common to 24 indicators, with nine new indicators emerging from the disaggregated analysis. These emerging indicators included: 3.1c, 6.1c, 6.1f, 7.1a, 7.1j, 8.1e, 8.2a, 9.3c, and 9.5a.

#### ***What indicators were common across all school levels? Which were unique to certain school levels?***

There were three indicators that were commonly significant for elementary, middle, and high schools.

These indicators were part of the KDE variance points and were from Standards 4 and 5: 4.1c, 4.1h, and 5.1d. There were 11 significant indicators unique to elementary schools, four unique to middle schools, and 17 unique to high schools. Six indicators were significant for middle and high schools only, and one for elementary and middle schools. These indicators were considered as secondary and elementary, respectively. Secondary-only indicators included: 3.1a, 3.1d, 4.1a, 4.1g, 4.1i, and 6.1c. Only 6.2c was identified as an elementary-only indicator.

#### ***Which indicators were most related to school improvement?***

As the absolute values of the Kendall-Stuart Tau-c increased, the strength of relationship between each in-



indicator and the school improvement classification (AL3, MG) increased. Table 2 highlighted the indicators by level of strength for each school level. To aid school leaders in prioritizing school improvement efforts, significant indicators were leveled into tiers composed of approximately five indicators each. Tier 1 indicators for all three levels of schools included Standard 4 indicators, with indicator 4.1h as the only indicator in Tier 1 shared by all three levels. At the elementary level, Standard 2 indicators complemented Standard 4 indicators, whereas the middle

school was almost entirely Standard 4, except for Standard 8.1d, which was related to the efficient use of time by staff. Tier 1 at the high school level included indicators related to leadership (7.1g), assessment (2.1b), teacher content knowledge (3.1d), and the availability of instructional assistance for students outside of class (5.1d). Tier 2 and Tier 3 became increasingly divergent, as no indicators were shared across school levels.

Table 5. Tiered SISI Indicators by School Level with Tc Coefficients

	Elementary	Middle	High
Tier 1 .800 ≤ Tc < 1.0	None	8.1d	4.1a, 4.1h, 7.1g,
Tier 2 .700 ≤ Tc < .800	4.1c	4.1c, 4.1e, 4.1g, 4.1h	2.1b, 3.1d, 3.1f, 4.1b, 4.1j, 5.1d, 6.1c, 6.2b, 6.2f, 7.1h, 9.3c
Tier 3 .600 ≤ Tc < .700	1.1g, 2.1c, 2.1h, 4.1h, 4.1j, 5.1a, 6.2d, 7.1f,	3.1h, 4.1a, 4.1i, 5.1e	2.1d, 3.1a, 3.1c, 4.1c, 4.1g, 4.1i, 5.1c, 6.1e, 6.1f, 7.1a, 7.1b, 7.1e, 7.1f, 7.1j, 7.1k, 8.1e
Tier 4 .500 ≤ Tc < .600	5.1b, 5.1d, 6.2c, 6.2f, 7.1b, 7.1h, 8.1b, 8.1d, 9.3b	5.1d, 6.1c, 6.2c,	

All values significant at  $p=.000$

### ***Which indicators were not related to school improvement?***

There were 40 indicators that were not significantly related to the school improvement designations. Of these, 12 were from Standard 9, six from Standard 8, five from Standard 6, four each for Standards 1 and 2, and three each for Standards 3, 4, and 7. All indicators in Standard 5 were significant to at least one level of school. These indicators were denoted in Tables 2, 3, and 4.

## **Discussion**

The standards and indicators for School Improvement are clearly pivotal to school accountability and improvement in Kentucky. The SISI provides for diagnostic intervention and establishes the framework for improvement activities in Assistance schools. Moreover,

lessons learned through the application of the SISI and the exploration of the variance point concept affect schools in the state regardless of accountability classification. As school leaders work to create focused improvement by prioritizing problems and solutions, it becomes important for all that the information provided regarding best practices through the variance points is valid and reliable.

As significant indicators and variance points are discussed, it is important to recognize that the variance point concept identifies gaps in practice—elements that are present in one setting but not in another. When an indicator is not significant or termed a variance point, that does not mean that it is unimportant; rather, it may be fundamental and therefore inherently present in both settings. For example, indicator 1.1f states that "there is in place a systematic process for monitoring, evaluating, and reviewing the curriculum." This practice was not found to differ signifi-

cantly in Assistance Level 3 or Meeting Goals schools in this analysis, nor was it a variance point in the KDE 2004–2007 report. Yet, this is an important indicator, a practice that would be considered as fundamental in school today.

*Common significant indicators.* Only three indicators for school improvement were significant for elementary, middle, and high schools. This reinforces the perception by survey respondents in 2002 (AEL, 2002) with regard to the efficacy of audit recommendation. This finding implies that, although a very few practices made a significant impact for all levels of schools, the impact of specific school improvement practices may differ between elementary, middle, and high schools. This idea has implications not only for practitioners serving at the various school levels (elementary, middle, and high) but also for those who train aspiring school leaders and those who provide their professional development. Some educational practices seem to have varying degrees of impact, depending on the level of the school.

The three common significant indicators are (a) 4.1c: teachers hold high expectations for all students academically and behaviorally and this is evidenced in their practice; (b) 4.1h: there is evidence that the teachers and staff care about students and inspire their best efforts; and (c) 5.1d: students are provided with a variety of opportunities to receive additional assistance to support their learning, beyond the initial classroom instruction. Indicators 4.1c and 4.1h clearly imply that hiring practices made a difference between the Assistance and Meeting Goals schools, as at the root, these indicators are dispositional. This finding additionally validates discussions among teacher education units with regard to the measurement of dispositions. Indicator 5.1d is timely because differentiated instructional models are currently being developed in many schools, validating this practice to school leaders who are working hard to develop capacities in instruction and assessment to meet the needs of all students.

Extant KDE variance points that were not congruent with the significant indicators in this study differed in nature. Again, these practices are not unimportant, rather simply were not significantly different between the two groups of schools. For example, the involvement of teachers and nonteaching staff in decision making as an indicator does reflect an accepted practice. However, it is conceivable that this practice might

occur sufficiently in all settings through school-based decision making (SBDM), required in Kentucky, thereby not yielding statistically significant different audit ratings. There are several indicators that, for middle and high school, there was no rating higher than a 2, with a 3 representing target. These findings suggest that there may be untapped potential with regard to the implementation of some practices. If a school can meet goals with a rating of 1 or 2, how much better could things be if the school fully functioned in the indicator area? The indicators in question addressed the frequency, rigor, and authenticity of classroom assessments in the middle schools, the use of multiple assessments, and the access of students to guidance and other supports in the high schools. Council policies and planning in general were cause for a rating of 1 or 2 in the middle school. School leaders in schools that are Progressing or in Meeting Goals schools that have ceased improving may find that these areas offer opportunities for growth for the school.

*School culture.* The relative strength of relationship of indicators suggests that Standard 4, School Culture, is key to differences between the schools in the sample. This finding is consistent conceptually with the KDE variance points, although the ordering of specific indicators may vary. Standard 7, which addresses leadership, was more prominent in high school results than in elementary and middle schools. This may be due to the complex nature of high schools, which require more from school leaders.

*Standard 9.* The limited number of variance points for Standard 9 (none identified by KDE and two at the elementary and two at the high school identified by this study) may call into question the impact this standard and related indicators have on student achievement. While short- and long-range planning have been an expected activity for school leaders, the difference in the ways educators in Meeting Goals schools and Level 3 schools plan was not statistically different. The schools' improvement plans seem to have a minimal effect in practice, suggesting a review of how improvement plans are developed and used to affect student achievement.

*High schools.* CATS data reveal that, as a whole, elementary schools consistently outpace middle and high schools (KDE, 2007). Yet a portion of this data analysis reveals 30 practices (variance points) that are com-

pleted more effectively at Meeting Goals high schools than at Level 3 schools. High school leaders and assigned HSEs may want to consider a more focused approach to student achievement, tapping into the variance points identified specifically for high schools. Additionally, consideration may be given to eliminating practices that have little or no empirical evidence of improving student achievement. This more focused approach should improve student learning and provide additional time to engage in practices associated with identified variance points.

## Limitations and Recommendations

Researchers found the sample of Assistance and Meeting Goals schools to be very different demographically. Assistance schools typically were poorer, with many located in metropolitan communities, whereas the Meeting Goals schools were less impoverished and much more rurally located. There are poor, metropolitan schools in Kentucky that are Meeting Goals; they were just not audited. Researchers suggest a matched-pairs approach to selecting Meeting Goals schools would provide more valid data with which to draw conclusions concerning variance points.

Sample size was also an issue, as the small sample limited the choice of statistical processes that work with the data provided. As more and more schools are audited, a sufficient sample size will accumulate to support more interpretable statistics, such as Chi-square, that were not appropriate given the nature of the data at this time.

Consistency of ratings between audit teams needs further discussion. While the training of audit team members involves multiple days of instruction, the lack of activities to ensure inter-rater reliability weakens comparison between schools audited by different teams. Clearly delineated practices under each rating level and suggested examples of supporting evidence tend to guide team rankings. Nevertheless, measures of consistency of rankings between audit team members and audit teams warrants review. Since the results from these audits are used to shape policy even in the absence of such validation studies, the assumption was made that the ratings were consistent for the purpose of this analysis.

As 2014 fast approaches, the date by which all Kentucky schools are to be measured as proficient, the

need to tailor educational practices to the schools and the students they serve grows. While this study suggests that the effectiveness of certain educational practices varies from elementary to middle to high schools, the same may also hold true related to other demographic factors. For example, practices that have a significant, positive impact on student learning in large, urban high schools may have less of an impact on large, rural high schools. Achievement gaps among various student populations within schools also support the notion that not only do instructional practices need to be modified to meet the varying needs of the students, but leadership practices may need review as well. Finally, some may embrace the SISI as a “one size fits all” type of leadership and educational practice. In reality, the nuances found among students within a school and from one school to another clearly call for more measured, data-informed educational decisions and practices.

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## Appendix A

### *SISI Standards and Listing of Abbreviated Indicators*

A full explanation of the Standards and Indicators for School Improvement can be found at the following link <http://www.education.ky.gov/KDE/Administrative+Resources/School+Improvement/Standards+and+Indicators+for+School+Improvement>

#### *Standard 1*

The school develops and implements a curriculum that is rigorous, intentional, and aligned to state and local standards.

- 1.1a Aligned with academic expectation, core content, program of studies
- 1.1b Discussions among schools regarding curriculum standards
- 1.1c Discussions among schools to eliminate overlaps, close gaps
- 1.1d Vertical communication w/focus on key transition points
- 1.1e Links to continuing education, life and career options
- 1.1f Process to monitor, evaluate and review curriculum
- 1.1g Common academic core for all students

#### *Standard 2*

The school uses multiple evaluation and assessment strategies to continuously monitor and modify instruction to meet student needs and support proficient student work.

- 2.1a Classroom assessments are frequent, rigorous, aligned
- 2.1b Teachers collaborate in design of assessment, aligned
- 2.1c Students can articulate the expectations, know requirements
- 2.1d Test scores used to identify gaps
- 2.1e Multiple assessments provide feedback on learning
- 2.1f Performance standards communicated and observable
- 2.1g CATS coordination—building and district
- 2.1h Student work analyzed

#### *Standard 3*

The school's instructional program actively engages all students by using effective, varied and research-based practices to improve student academic performance.

- 3.1a Varied instructional strategies used in all classrooms
- 3.1b Instructional strategies/activities aligned with goals
- 3.1c Strategies monitored/aligned to address learning styles
- 3.1d Teachers demonstrate content knowledge
- 3.1e Teachers incorporate technology in classrooms
- 3.1f Sufficient resources available
- 3.1g Teacher collaboration to review student work
- 3.1h Homework is frequent, monitored and tied to instructional practice

#### *Standard 4*

The school/district functions as an effective learning community and supports a climate conducive to performance excellence.

- 4.1a Leadership support for safe, orderly environment

- 4.1b Leadership beliefs and practices for high achievement
- 4.1c Teacher beliefs and practices for high achievement
- 4.1d Teachers and non-teaching staff involved in decision making
- 4.1e Teachers accept their role in student success/failure
- 4.1f Effective assignment and use of staff strengths
- 4.1g Teachers communicate student progress with parents
- 4.1h Teachers care about kids and inspire their best efforts
- 4.1i Multiple communication strategies used to disseminate info
- 4.1j Student achievement valued and publicly celebrated
- 4.1k Equity and diversity valued and supported

#### *Standard 5*

The school/district works with families and community groups to remove barriers to learning in an effort to meet the intellectual, social, career, and developmental needs of students.

- 5.1a Families and communities active partners
- 5.1b All students have access to all curriculum
- 5.1c School provides organizational structure
- 5.1d Student instructional assistance outside of classroom
- 5.1e Accurate student record keeping system

#### *Standard 6*

The school/district provides research-based, results driven professional development opportunities for staff and implements performance evaluation procedures in order to improve teaching and learning.

- 6.1a Long term professional growth plans
- 6.1b Building capacity with on-going PD
- 6.1c Staff development aligned with student performance goals
- 6.1d School improvement goals connected to student learning goals
- 6.1e PD ongoing and job embedded
- 6.1f PD aligned to analysis of test data
- 6.2a School has clearly defined evaluation process
- 6.2b Leadership provides sufficient PD resources
- 6.2c Evaluations and growth plans effectively used
- 6.2d Evaluation process meets or exceeds statutes
- 6.2e Instructional leadership needs addressed
- 6.2f Leadership provides evaluation follow-up and support

#### *Standard 7*

School/district instructional decisions focus on support for teaching and learning, organizational direction, high performance expectations, creating a learning culture, and developing leadership capacity.

- 7.1a Leadership developed shared vision
- 7.1b Leadership decisions are collaborative, data driven, performance
- 7.1c Leadership personal PD plan focused on effective skills
- 7.1d Leadership disaggregates data
- 7.1e Leadership provides access to curriculum and data
- 7.1f Leadership maximizes time effectiveness
- 7.1g Leadership provides resources, monitors progress, removes barriers to learning
- 7.1h Leadership ensures safe and effective learning
- 7.1i Leadership ensures necessary SBDM policies

- 7.1j SBDM has intentional focus on student academic performance
- 7.1k Leader has skills in academic performance, learning environment, efficiency

### *Standard 8*

The organization of the school/district maximizes use of time, all available space and other resources to maximize teaching and learning and support high student and staff performances.

- 8.1a Maximizes organization and resources for achievement
- 8.1b Master schedule provides all students access
- 8.1c Staffing based on student needs
- 8.1d Staff 's efficient use of time to maximize learning
- 8.1e Team vertical and horizontal planning focused on improvement plan
- 8.1f Schedule aligned with student learning needs
- 8.2a Resources used, equitable
- 8.2b Discretionary funds allocated on data based needs
- 8.2c Funds aligned with CP goals
- 8.2d State/Federal funds allocated with CP goals and data needs

### *Standard 9*

The school/district develops, implements and evaluates a comprehensive school improvement plan that communicates a clear purpose, direction and action plan focused on teaching and learning.

- 9.1a Collaborative process
- 9.2a Planning process involves collecting, managing and analyzing data
- 9.2b Uses data for school improvement planning
- 9.3a Plans reflect research /expectations for learning and are reviewed by team
- 9.3b Staff analyzes student learning needs
- 9.3c Desired learning results are defined
- 9.4a Data used to determine strengths and limitations
- 9.4b School goals are defined
- 9.5a School improvement action steps aligned with goals and objectives
- 9.5b Plan identifies resources, timelines & person responsible
- 9.5c Process to effectively evaluate plan
- 9.5d Plan aligned with mission, beliefs, school profile, desired results
- 9.6a Plan implemented as developed
- 9.6b Evaluate degree of student learning set by plan
- 9.6c Evaluate student performance according to plan
- 9.6d Evidence to sustain the commitment to continuous improvement